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**Growth of Ultra-High Density Vertically-Aligned Carbon Nanotube Forests** JOHN ROBERTSON, SANTIAGO ESCONJAUREGUI, MARTIN FOUQUET, BERNHARD BAYER, STEPHAN HOFMANN, Cambridge University — We present a general catalyst design method to synthesise ultra-high density, aligned forests of carbon nanotubes by cyclic deposition and annealing of catalyst thin-films. This leads to nanotube forests with an area density of at least  $10^{13}$  cm<sup>-2</sup>, over one order of magnitude higher than existing values (Hata 2004, Zhong 2006), and close to the limit of a fully dense forest. The technique consists of cycles of ultra-thin metal film deposition, annealing, and immobilisation. The nanotubes are then grown as normally by Chemical Vapor Deposition. These ultra-dense forests are needed to use carbon nanotubes as vias and interconnects in integrated circuits and as thermal interface materials. Further density increase to  $10^{14}$  cm<sup>-2</sup> by reducing nanotube diameter is possible.

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